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AUTHOR Mosier, Nancy R.
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ABSTRACT

A "learning by doing" class was offered by the University of Minnesota to teach needs assessment concepts and approaches. The needs assessment was conducted at the Onan Corporation, which produces industrial engines and other equipment. The class was composed of nine graduate students in industrial or vocational education and was organized as a consulting group with the instructor as manager. After becoming familiar with the concept and methods of needs assessment, the students developed specific plans for the 11-week project: (1) interviews to determine the current usage and available hardware and software, (2) questionnaire development and administration, and (3) report preparation. The interviews with Onan employees, who were computer users or trainers, focused on: uses for personal computers and fourth-generation languages, current and desired competencies in computer technology, type of computer-related training that had been conducted at Onan, and type of training that was needed. The questionnaire obtained information on: employees, basic skills, computer access and usage, and future expectations. Six suggestions for planning and conducting this type of class project are offered, including: the class should be small, and the project should answer an immediate need for the company. (SW)

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Training Needs Assessment: A Model for University-Industry Cooperation

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Nancy R. Mosier
Control Data Corporation

Training in business and industry is a rapidly growing field, as evidenced, in part, by the growth in membership in ASTD, NSPI, and this special interest group. Colleges and universities are responding to this growth by offering more courses and degrees in such areas as industrial education, industrial relations, organizational psychology, and training and development. Typically, courses cover such areas as design, development, delivery, and evaluation of training programs, and techniques for organization development. One area that is usually not included is needs assessment.

Needs assessment can be thought of as an investigation process that results in a proposal or recommendations for solving a problem. A problem may be defined broadly as "how some situation deviates from a model situation" (Harless, 1975). Thus, when trainers conduct needs assessments they must really ask and answer three questions:

- Where are we now? (What is the current situation?)
- Where do we want to be ? (What is the model situation?)
- How do we get there? (What are the recommendations for solving the problem?)

In conducting needs assessments, trainers use a variety of techniques to answer these questions (see, e.g. Mager and Pipe, 1970; Swanson, 1981, 1982; and Zemke and Kramlinger, 1982). The process itself is dynamic and each situation is unique in terms of such things as clientele, time, budget, and available resources. Each assessment must be tailored to fit the organization in which it will be conducted and the characteristics of the particular problem to be studied. Individuals who conduct needs assessments need to be familiar with a variety of information gathering and analysis techniques. They must also learn the necessity of flexibility in such things as defining the nature and scope of a problem and the timelines for completing steps of the process. Just as there is no single method or process for doing needs assessments, there is no easy way to teach needs assessment methods in the classroom. Much of what one should learn is best taught through actual experience.

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The purpose of this paper is to describe a "learning by doing" class in needs assessment in which a University of Minnesota course was taught by conducting a needs assessment at Onan Corporation. It is not intended to be a description of a needs assessment methodology (although the methodology will be discussed).

Onan Corporation

Onan Corporation produces electrical generator sets, industrial engines, and power conditioning equipment. It provides power conversion products to domestic and international markets. The company has grown from a small family business in the 1920's to a corporation with 4,000 employees. Like most durable-goods manufacturers, Onan experienced steady growth for several generations. The business climate was healthy and stable and competition was light. Recently, however, Onan, like many other American businesses, has faced fierce competition, unstable markets, and an uncertain economy. These new constraints have created internal pressures for increased productivity and cost control.

Automation is one strategy the company has used to reduce costs and increase productivity. Noticeable and immediate gains were achieved in both factory and office areas when automated systems were introduced. The computer has played a significant role in most applications.

Computer applications became pervasive and diverse as mainframe, word-processing, computer-aided drafting and manufacturing, and personal computer technologies were used. Emphasis was placed on installing appropriate hardware/software configurations and orienting users to their new systems. Persons in user departments determined exactly how they would apply computer technology to meet their unit objectives. Department managers decided how and by whom work was to be performed, and they were held responsible for the development of their employees' computer skills.

By early 1984, operating units were using a number of approaches to developing employees' computer skills. Training activities ranged from no training whatsoever to part-time computer trainers delivering courses on a regular schedule. However, most computer skills learning occurred through unstructured self-instruction with the use of manuals and disk tutorials. Occasionally, employees attended local seminars.

Given the diversity of hardware and software, the variety of computer applications, and the multiplicity of

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existing computer training methods, human resource developers at Onan recognized that they should conduct an assessment of the need for computer training within the corporation.

Onan's human resource and training department had already established a working relationship with the University of Minnesota's Vocational Education department. Onan regularly offers paid internships for graduate students in industrial and vocational education. These internships focus on the design and delivery of training and career development programs. Two members from the Onan human resource development staff team taught a course on training practices in business and industry in 1983 and one of those staff members also taught a seminar on managing training. When Onan approached the University about doing the needs assessment, it was discovered that a course on needs assessment techniques coincided with that request. It was agreed that the needs assessment would be a class project and that a computer training needs assessment would be produced for Onan.

Methodology

(This section describes how the class was organized and taught. The methods for conducting the needs assessment are described within that context.)

The class comprised nine graduate students in industrial or vocational education and one professor. The computer literacy levels ranged from students who had done extensive work on both mainframes and personal computers to students who had never seen a mainframe or read a computer printout.

The class was organized as a consulting group with the instructor as manager. Students were treated as professional, external consultants and were expected to conduct their work accordingly. Members of the class/consulting group presented themselves as part of the consulting activity and were given unsupervised access to employees according to a predetermined schedule. Onan's training director acted as the liaison between the group and the company, especially in the areas of communication and planning.

Getting Up To Speed

The first few class sessions were spent learning about Onan Corporation and learning about needs assessments. The training director explained the history of Onan, described the organizational structure and political climate, and

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suggested several sets of variables that could be used in investigating and reporting the computer training needs. The information services manager provided information about the types of computers used in Onan and the uses to which they were put. In addition, class/consulting group members read and discussed relevant literature on needs assessment theories and strategies (e.g., Kaufman, 1983; Mager, 1983; and Scriven and Roth, 1978;)

Once the class/consulting group became somewhat familiar with the concept of needs assessment and the general methods or strategies for conducting one, they began to develop specific plans to fit within the 11-week timeframe and the Onan framework. The steps they chose included the following:

1. Conduct preliminary interviews to determine the current usage and available hardware and software.

2. Develop a questionnaire as the primary data gathering tool.

3. Analyze questionnaire results and prepare report of findings and recommendations.

Whenever possible, these activities were carried out in teams. Students worked in groups of two or three and team members changed with each activity. Each activity is described in more detail in the following paragraphs.

Preliminary Interviews

Interviews were conducted with several Onan employees who were themselves computer users or who had provided training on the use of personal computers or mainframe terminals. The interviews were conducted in teams, so that one computer literate student and one novice were paired for each interview. The interviews focussed on the following topics:

- The range of uses for personal computers and fourth generation languages,
- The current and desired competencies in computer technology,
- The type of computer-related training that had been conducted at Onan,
- The type of computer-related training that was needed or perceived to be most effective, and

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- Specific questions to include in the questionnaire.

From these initial investigations, it was determined that computer technology fell into four areas: CAD/CAM, word-processing, fourth-generation languages for the mainframe, and stand-alone personal computers. Although the installation and use of CAD/CAM and word-processing systems had corporate-wide implications for increased productivity and profits, they were considered specialized machines and their use was limited to a few job families. In addition, it was felt that there was more pre-employment and other training for these applications than for mainframe or personal omputer use. Therefore, it was decided to limit the needs assessment to fourth-generation language and personal computer training needs.

In addition, it was clear that, although internal training on the capabilities and use of computers was available, it was neither clearly defined nor systematically accessed.

Questionnaire Development

The primary data gathering device was a questionnaire developed by the class/consulting group. There were four parts to the questionnaire: employee information, basic skills, computer access and usage, and expectations for the future. (A copy of the questionnaire is attached.) This format was discussed and agreed upon by all members; the questions were written in teams of two or three with each team assigned one of the sections. Where possible, at least one member of the team had some experience writing questionnaires prior to this course.

The questionnaire was pilot-tested on a group of 23 office employees. These participants were asked to respond to all the questions and to make comments about how the questionnaire could be improved.

On the basis of the pilot results and the participants comments, the questionnaire was revised and distributed to 886 office employees and production supervisors and superintendents at the headquarters location. Two-thirds (585) of the questionnaires were returned.

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Analysis and Reports

The turn-around time on the final questionnaires was two weeks. During that time, the class/consulting group developed questions they wanted to be able to answer from the data and sample data tables. (These were then given to two other students in vocational education who did the actual data analysis.) The class/consulting group also worked on a format for the final written report. Because the introduction, purpose, and methodology sections could be written without seeing the data analysis, those sections were written by three group members.

The computer printouts were first reviewed by the class/consulting group as a whole so that those members unfamiliar with reading printouts could learn how to do so. Then the printouts were divided up according to the previously determined report sections and teams were then assigned to write those sections.

One student was given the role of report editor. She participated in the review of printouts but did not write any of the sections. Instead, she took all the sections written by other class/consulting group members, edited them for consistency of style, and prepared the final version of the report.

The final written report was distributed to all top executives in the plant. In addition, the class/consulting group gave an oral report to a group of company vice presidents and other executives.

Outcomes

The intent of the class experience was to teach, in a "learning by doing" mode, some of the concepts of, and approaches to, needs assessment. Everyone who participated agreed that this goal was accomplished and that much of what they had learned could never be replicated in a classroom environment.

The needs assessment provided a learning situation with valid content; the methods discussed could be applied directly and immediately to the task at hand. It was also a work situation with specific objectives and demanding time schedules. Students responded by working diligently and cooperatively to develop creative approaches or solutions to the problems presented.

Individual students experienced additional benefits depending on their previous experiences. For some students,

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this was the first experience in a business setting. For others, it was the first time to design questionnaires, analyze data, or write or present reports. All students were exposed to the different perspectives and motivations of the professor, the training director, and other corporate executives.

Perhaps the most unexpected, yet very rewarding, outcomes are related to the concept of group process or group dynamics. The class was structured in a very cooperative way; almost all work was done in teams and all students shared the goal of producing a useable report for Onan. During the 11 weeks of the course, the class/consulting group went through all the phases of group dynamics. Many commented that the opportunity to work in a large group, to work as cooperative teams, and to share a goal was unique in their academic experiences.

A second goal of the course was to produce materials Onan's human resource and training department could use in planning computer-related training. The results and recommendations from this assessment were quite global. However, Onan took the data the class had gathered and did some more in-depth analyses by department and by some employee characteristics. These analyses were used to help departments plan appropriate training for their personnel.

Recommendations

"Learning by doing" is an excellent way to teach needs assessment. The outcomes, both planned and unplanned, in this project were all positive. But, some guidelines should be followed in planning and conducting such projects.

- The class should be small. Fewer than six would be probably be too small; and more than twelve would probably be too large to coordinate.
- The project should answer an immediate, real need for the company involved. This provides a realistic picture of the training field.
- It should be something that can be done in a relatively short time. Eleven weeks was tight but manageable. Much more time than that might have given an unrealistic picture of the business climate.
- The instructor must be flexible. Although much of the learning content can be determined before the course begins, the actual problems and

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learning experiences cannot be predicted.

- The instructor must also be careful not to get so caught up in the managing role that instruction is slighted. He or she must allow learning to happen and take advantage of the opportunities to make specific problems more generalizable. One method that worked well was for the instructor to prepare brief notes or minutes of each session. These notes highlighted the previous week's work, individual assignments, and learning opportunities. Each session began with a review of these notes and discussion of problems and outcomes of the assignments.

- The group dynamics cannot be planned or built in. They will be more effective if allowed, rather than forced, to happen.

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COMPUTER TRAINING NEEDS ASSESSMENT

Onan is currently conducting a computer training needs assessment for its Minneapolis location. The goal of the assessment is to determine the scope and depth of training needs as they relate to the use of personal computers and the mainframe computer. The target population is "office" employees and plant superintendents and supervisors.

A consulting group from the University of Minnesota is conducting the assessment. This questionnaire has been developed by the consulting group to assess and analyze the training needs. The individual responses will be anonymous and confidential. The results of the assessment will be used to make recommendations for training Onan employees.

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EMPLOYEE INFORMATION

1. Department Number _____

2. Employee Status
   - ☐ Exempt supervisory
   - ☐ Exempt non-supervisory
   - ☐ Non-exempt

3. Educational Level
   - ☐ GED or high school
   - ☐ Some college
   - ☐ Bachelors degree or equivalent
   - ☐ Graduate work

4. How long have you worked at Onan?
   - ☐ Less than 1 year
   - ☐ 1-5 years
   - ☐ 6- 10 years
   - ☐ 11-20 years
   - ☐ More than 20 years

5. How do you feel about computers in the workplace?
   - ☐ Positive
   - ☐ Negative
   - ☐ Neutral

BASIC SKILLS

1. What types of computers have you used? (check all that apply)
   - ☐ Home video (games)
   - ☐ Personal (home or office)
   - ☐ Mainframe
   - ☐ None

2. Do you feel comfortable using a computer?
   - ☐ Yes
   - ☐ No
   - ☐ Don't know

3. Do you understand basic computer concepts?
   - ☐ Yes
   - ☐ No
   - ☐ Don't know

4. Do you think that your current keyboarding (typing) ability is adequate for computer use?
   - ☐ Yes
   - ☐ No
   - ☐ Don't know

5. How comfortable are you with the personal and/or mainframe keyboards including the function keys?
   - ☐ Very
   - ☐ Somewhat
   - ☐ Not at all

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